Leibniz Universität Hannover

Oberseminar
Institut für Algebraische Geometrie

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Orbifold fundamental groups of Calabi-Yau surface pairs

In algebraic topology, the Galois correspondence allows to view the fundamental group $\pi_1(X)$ of a topological manifold X as parametrizing unramified covers of X, via its subgroups. In algebraic geometry, it is however common to deal with finite covers that are not étale. A notion of orbifold fundamental group for pairs (X, D) has been circulating in the algebro-geometric literature since the 1990ies to play a similar role to the usual fundamental group for non necessarily étale covers. It exhibits a correspondence à la Galois: For a complex projective variety X with relatively mild singularities, and an effective divisor D on X with rational coefficients in $[0, 1]$, the normal finite index subgroups of the orbifold fundamental group $\pi_1(X, D)$ parametrize finite Galois covers of X whose ramification is controlled, both geometrically and numerically, by the divisor D.

In this talk, we impose that X is a complex projective curve or surface. In this set-up, we explain how mild positivity conditions on the curvature of the pair (X, D) and on its singularities force the group $\pi_1(X, D)$ to be "rather small". More precisely, it admits a normal subgroup of index at most 7200 that is either abelian of rank at most 4, or part of a very explicit list of nilpotent groups of length 2. We give some examples of the more extreme cases in this result. Finally, we explain how the (sharp) constant 7200 that appears in this result is the Jordan constant of the complex Cremona group in dimension 2, computed by E. Yasinsky.

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Alle Interessierten sind herzlich eingeladen.